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IN THE

Supreme Court of the United States

OCTOBER TERM, 1970.

No. 1746

NATIONAL GYPSUM COMPANY AND
PLAZA PLASTERING COMPANY,
Petitioners,

vs.

UNITED STATES GYPSUM COMPANY,
Respondent.

APPENDIX TO PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SEVENTH CIRCUIT.

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May 22, 1971.

THE GUNTHORP-WARREN PRINTING COMPANY, CHICAGO

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APPENDIX TO PETITION FOR WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SEVENTH CIRCUIT.

IN THE UNITED STATES COURT OF APPEALS
for the Seventh Circuit

September Term, 1969 September Session, 1969

No. 17613

UNITED STATES GYPSUM COMPANY, *Plaintiff-Appellee,*
v.
NATIONAL GYPSUM COMPANY and PLAZA PLASTERING CO., *Defendants-Appellants.*

Appeal from the United States District Court for the Northern District of Illinois, Eastern Division.

March 11, 1971

Before HASTINGS, *Senior Circuit Judge,* FAIRCHILD and KERNER, *Circuit Judges.*

FAIRCHILD, *Circuit Judge.* This appeal is a sequel to *United States Gypsum Company* v. *National Gypsum Company* (7th Cir., 1967), 387 F. 2d 799. Many of the pertinent facts appear in that opinion. The action is for infringement of a patent issued to Joseph W. Gill, "Method of Covering the Joint Between Wallboard and the Resultant Product."[1] We remanded the cause for further proceedings.

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1. No. 2,749,267, issued June 5, 1956, the original application having been filed March 30, 1950.

On remand, the district court made findings of fact on the basis of which it decided the subject matter would not have been obvious and the invention had not been in public use more than one year before the application. Appellants National and Plaza challenge these decisions and raise a third issue.

A. *Obviousness.*

1. *Scope and content of the prior art:* Where two sheets of wallboard join, the industry has for a long time used cement and strips or tapes of bridging material such as cloth, metal, or paper.

Green '667[2] claimed, in part, "a strip of thin metallic foil having perforations extending along" a wallboard joint. In the specifications, it was said: "To assist any moisture in the cementitious adhesive to escape and thus expedite drying, and to facilitate mechanical bond between the thin metal foil and the wallboard, I prefer to perforate the foil in a casual way. The perforations . . . may take the form of holes of any shape so spaced that they leave sufficient tensile strength across the reinforced joint." A sketch indicates that the intended perforations were not minute, but readily visible holes. Metal tape was used for a time.

Page '982[3] claimed in part "A paper tape suitable for adhesive attachment in wallboard joints, comprising a strip of paper having a substantial proportion of crossed fibers extending transversely of said strip. . . ." The specifications indicated Page's interest in "a high transverse tensile strength, a low stretch, a high breaking load, and a high modulus of elasticity . . . low transverse and

2. No. 1,703,667, "Wall-Board-Joint System," issued February 26, 1929 to Ernest Green, assignor to U. S. G.

3. No. 2,047,982, "Wallboard Joint," issued July 21, 1936 to John Page, assignor to U. S. G.

longitudinal expansion on wetting." So-called "plain" tape has been used. Page '433[4] claimed "Method of and Apparatus for Manufacturing Wallboard Joint Tape" with some of the characteristics referred to in Page '982.

Speer '523[5] claimed in part "A tape . . . composed of overlying, adhering strips of perforated paper and wide mesh cloth. . . ." Speer said that the perforations in the paper "are preferably larger than the mesh openings of the cloth strip so that certain of the strands of the cloth strip span or intersect the paper perforations and function as keys or interconnecting webs in securing the tape to the joint. . . . These perforations permit the escape of air from between the tape and the wallboard and eliminate the formation of air pockets." A sketch shows that the perforations are not minute, but are readily visible. In practice, perforations in paper tape were produced by a punch and had diameters of 1/16 inch.

Camp '509[6] described in the specifications a tape through the perforations in which the adhesive is forced on application.

Crandell '785[7] claimed in part "a tape of finely woven fabric placed over said [wall board] joint, said tape being attached to the edges of adjacent panels by means of an elastic glue substantially impermeable to air and moisture, said glue permeating said tape throughout. . . ." One of the stated advantages was the elimination of "breathing . . . since the glue is substantially impermeable to air and moisture."

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4. No. 2,180,433, issued Nov. 21, 1939.

5. No. 2,314,523, "Wallboard Joint Structure", issued Mar. 23, 1943 to Alexander D. Speer.

6. No. 2,537,609, "Process for Making Wallboard", issued Jan. 9, 1951 to Thomas P. Camp, assignor to U. S. G.

7. No. 2,064,785, "Sealed Joint", issued Dec. 15, 1936 to Dean D. Crandell, assignor to National.

None of the prior art patents which directly relate to cementing and taping wallboard joints suggested the use of tape with perforations of a size which would permit the escape of air but prevent the escape of adhesive, none suggested perforation by electric spark, and none specified dimensions of perforations in tape within the range stated in Gill.

For a brief time before 1938, National produced a balloon cloth tape which was applied to joints in the manner set forth in Crandell '785. It did not achieve wide usage. Tape which was said to be a left over sample of National's balloon cloth tape was before the court. When not yet permeated with glue, the tape was highly porous. The average size of the interstices between the strands was smaller than the size of the smallest perforations specified in Gill, although the sizes of the largest interstices were within the range indicated in Gill. Appellants suggest that these interstices were perforations of such size as to permit the escape of air but prevent the escape of adhesive. The character of the tape and the mode of its application, however, were so different from paper tape that neither the patent nor the balloon cloth tape may fairly be said to suggest the Gill idea. Moreover, the district court found that in practice, National's balloon cloth tape had been subject to blisters, formed over air pockets behind it.

One patent relating to the structure of wallboard disclosed possible spark perforation of a thin metal layer covering the wallboard. The invention concerned structure of wallboard and not formation of joints between pieces of wallboard. Roos '345[8] claimed in part "gypsum-core building boards . . . said rear surfaces of the boards being substantially completely covered with perforated metal

8. No. 1,914,345, "Wall Construction", issued June 13, 1933 to Carlisle K. Roos, assignor to U. S. G.

foil." The indicated purpose of the foil was to prevent excessively rapid escape of moisture from the boards and to enhance the heat resistance qualities of the completed wall. Roos preferred "perforations so minute that they are barely visible to the naked eye. . . . The perforations may be formed . . . by the use of small electric arcs which will serve to puncture the foil with suitably sized and spaced holes."

Several other patents disclose the idea of perforating paper and other materials by the use of electric arcs. None of these patents suggest application to wallboard or wallboard joints. Meaker '546[9] claimed in part "A paper bag . . . formed with a large number of electric arc pierced, burrless perforations minute enough to prevent any substantial amount of pulverulent material from sifting out of the bag therethrough but sufficient in number and spaced closely enough together . . . to substantially increase the air perviousness of the bag, whereby, through escape of air through said perforations the filling of the bag is facilitated. . . ." Meaker stated that "The size of the perforations may vary, for example, from about 1/200 to 1/1000 of an inch in average diameter. The number may vary from ten to one hundred per square inch, more or less. The pattern or spacing of the openings will ordinarily be quite irregular. However, the invention is not limited to these particulars, which are merely preferential and illustrative. The holes though small are cleancut, without burrs and tests indicate that they do not materially lessen the strength of the paper. . . ."

There are several later patents disclosing methods and apparatus for perforating paper or other sheet material:

9. No. 2,340,546, "Container", issued Feb. 1, 1944 to John W. Meaker.

Meaker '508;[10] Wilsey '246;[11] Meaker '069;[12] and Meaker '366.[13]

2. *Differences between the prior art and the Gill claims:* Prior art in the particular field of forming wallboard joints included the use of unperforated paper tape and paper tape with perforations created by punches and having a diameter of 1/16th inch. Meaker '508, and other patents, disclosed the idea of perforating paper by electric spark, producing holes with a range of diameters from .001 to .005 inch, and the idea that paper so perforated would retain certain fine powder substances while permitting air to escape through the holes.

Gill sets forth a range of diameters from .002 to .020 inch. Other than that, the difference between the prior art and the Gill claims (although claim 5 is the only one which specifies spark produced perforations) is essentially that Gill adapted an idea similar to that of Meaker to known elements in the art of forming wallboard joints.

The district court made a number of findings as to the usefulness of the result accomplished. Appellants challenged them, and claim that spark perforation is only a "gimmick". There is conflict in the relevant evidence, however. The findings are supported by evidence and we do not consider them clearly erroneous. The court found that cloth tape was unsatisfactory for a number of reasons and that National's balloon cloth tape was subject to blisters, formed over air pockets behind it. Unperforated paper tape results in blisters. Met l and paper tapes with

10. No. 2,372,508, "Electrical Perforation of Paper and Other Fabrics", issued Mar. 27 1945 to John W. Meaker.

11. No. 2,385,246, "Method and Apparatus for Perforating Sheet Material", issued Sept. 18, 1945 to Irven H. Wilsey et al.

12. No. 2,388,069, "Electroperforation of Sheet Material", issued Oct. 30, 1945 to John W. Meaker et al.

13. No. 2,550,366, "Method and Apparatus for Electroplating Sheet Material", issued April 24, 1951 on application filed Oct. 25, 1946 to John W. Meaker et al.

substantial holes punched in them produced other disadvantages by reason of the extrusion of cement through the perforations. The court found that the use of tape conforming to Gill eliminated the need to buff nodules from the outer surface of the tape, resulting from cement escaping through punch perforations; substantially eliminated entrapment of air beneath the tape; avoided the pattern of punch perforation showing through the finished product; did not permit cement to pass through the tape while in the taping machine; and avoided creating the burrs and tabs which often remain attached to punch perforated paper tape.

3. *The level of ordinary skill in the pertinent art:* The district court found that wallboard joint tape applicators were persons of ordinary skill in the art, although it added that the subject matter was not obvious to National's "skilled research personnel who worked on the problems connected with the use of wallboard joint tapes, to National's other employees who produced and sold the tapes, or to National's field personnel who observed the use of wallboard joint tapes in the field." We have some doubt whether, in an industry where manufacturers of supplies have employees who devote considerable effort to seeking improvements in the products, the level of ordinary skill in the day to day ultimate use of such supplies is the appropriate level for the purpose of 35 U. S. C. § 103. The findings suggest that the district court had similar doubt and considered a higher level of skill which reflected experience as employees of manufacturers in attempting to improve the product and solve the customers' problems.

4. *Secondary considerations:* Spark perforated tape has enjoyed outstanding commercial success. U. S. G. put Gill tape on the market in 1950, at about the time the patent was first applied for. At first National's people

concluded that the Gill tape offered no advantage. Applicators used it, however, to such an extent that by 1952, National decided to make spark perforated in lieu of plain tape although the cost of producing the former might be 18 per cent greater. The combined production of spark perforated tape by U. S. G. and National in the seven years preceding trial was over eight billion feet.

A somewhat countervailing consideration is the fact that one other person worked on the same idea at about the same time. Mr. Mackey, apparently a small tape manufacturer in California, experimented with spark perforation of tape during about the same years in the late '40s when Gill was developing his idea. Mackey apparently knew of the Meaker spark perforated paper and applied the technique to wallboard tape. Additional facts concerning Mr. Mackey's efforts will appear in the discussion of public use.

5. *Presumption of validity:* All wallboard prior art patents mentioned in this opinion were cited as references except Crandell '785. The manager of National's patent department, who had the Crandell patent in his file, conceded that its relevance did not occur to him until some years after the issuance of the Gill patent and National's search for prior art. We agree with the district court that Crandell is less pertinent than those which were cited.

When the Gill application was first made, claiming tape and spark perforating apparatus, the examiner cited Meaker '546, Meaker '069, Meaker '508 and Roos '345. After the continuation application upon which the patent was issued, the examiner cited Meaker '546 and Roos '345. Of the patents concerning spark perforation mentioned in this opinion only Meaker '366 and Wilsey '246 were never cited. We agree with the district court that the latter two are less pertinent than those cited and that the two which were cited at both stages were the most pertinent.

In these circumstances Meaker '069 and '508 are deemed to have been considered, though not cited on the application

on which the patent was issued.[14] And the omission of the less pertinent Crandell '785, Meaker '366, and Wilsey '246 does not weaken the statutory presumption.[15] We see nothing in any of the omitted patents which would tend to create a closer question of obviousness than do the patents cited.

6. *Obviousness: Would it have been obvious at the time of invention to adapt the Meaker ideas to the use of tape and cement in forming wallboard joints?* Punch perforations in paper tape were of a size which readily let air escape from under the tape, but permitted extrusion of cement. Reduction in size of the punch perforations proved impracticable. Plain paper tape prevented extrusion of cement, but also trapped air. Appellants do not concede that this was a problem, nor that it was solved by Gill, but, assuming the affirmative, appear to argue as follows:

A hypothetical § 103 person (of ordinary skill in the art), desiring a tape which would not trap air but would retain cement, would find it obvious that perforations of some minute dimensions would let air, but not cement, pass. Since the hypothetical § 103 person is assumed to know everything in the public domain, he is assumed to know that Meaker's spark perforation technique would produce, in paper, holes of a size such that air would escape and certain powder would be retained, and the hypothetical § 103 person would find it obvious to experiment with spark perforation of tape to see whether he could produce perforated paper which would retain wet cement, but avoid entrapment of air.

The determination by judges of what would or would not have been obvious to a hypothetical § 103 person is often a fanciful enterprise, as we confess it is here.

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14. *Otto* v. *Koppers Company* (4th Cir., 1957), 246 F. 2d 789, 801.

15. *TSC Industries, Inc.* v. *International Harvester Company* (1968), 406 F. 2d 53, 55; *Otto* v. *Koppers Company, supra,* fn. 14.

In reaching the conclusion of nonobviousness, we bear in mind the following:

a. As found by the district court, "No one skilled in the art testified that the subject matter of the Gill invention was obvious at the time the invention was made."

b. The patent office examiner decided that it would not have been obvious. His decision is presumptively correct.[16]

c. The district judge concluded the subject matter would not have been obvious. Although his conclusion is not controlling on appeal, his advantage of close attention to the case while it was being presented entitles his conclusion to weight.

d. The commercial success, though a secondary consideration, seems relevant and persuasive here.

e. Our own subjective impression is that the subject matter would not have been obvious, particularly since the *Meaker* idea appears not to have previously been used or identified with the particular field of endeavor involved in this case.

Spark perforation makes possible the forming of minute holes of dimensions which accomplish the desired result, not feasible by use of previously used methods of perforation. Although appellants contend that the invention is "the mere changing of . . . size[17] we do not consider it simply that, under these circumstances.

B. *Prior public use.*

Appellants contend that the invention was in public use or on sale before March 30, 1949, one year before Gill's filing date.[18] They rely on the activity of the W. L. Mackey Company. The district court found that "There was no

16. 35 U. S. C. § 282.

17. See *American Infra-Red Radiant Co.* v. *Lambert Industries, Inc.* (8th Cir., 1966), 360 F. 2d 977, 987, cert. den. 385 U. S. 920.

18. 35 U. S. C. § 102(b).

evidence whatsoever that any spark perforated tape produced by the W. L. Mackey Company was used in forming wallboard joints prior to the critical date of March 30, 1949."

As already noted, Mr. Mackey experimented with spark perforated tape. He testified that he began his experiments in 1946 or 1947. Others corroborated him at least to the extent of his having done so before January, 1949. There was no evidence as to the measurement of perforations in any Mackey tape.

The earliest recorded sale by Mackey of spark perforated tape, so designated, occurred in January, 1950. He testified that he had sold some as early as 1948, but under the designation "beveled", the same as his plain tape. He gave no persuasive explanation for not giving it a distinct label. We conclude his testimony concerning these sales does not fulfill the standard of clear and convincing proof required to establish that an invention was in public use or on sale under sec. 102(b).[19]

In August, 1948, Mr. and Mrs. Mackey made a trip east by automobile and carried along "samples of spark tape which we called beveled tape." They left a sample with a Mr. Thomas at the plant of a customer in Louisiana and gave another to a Mr. Pine at the customer's plant in Illinois. Mackey said he wanted to get Pine's reaction to the tape. Pine testified that he made some tests. "When we examined it, we weren't too impressed with it, and I can only say that we probably gave it a good examination because Mr. Mackey was well liked by the principals of my company, and I was not anxious to put him in a doghouse, so to speak." After the tests, the balance of the tape was thrown away. Pine's answers to two questions put by counsel and containing the word "sell" are, in their context, less than clear and convincing proof that Mackey was

19. See *Julian* v. *Drying Systems Co.* (7th Cir., 1965), 346 F. 2d 336, 338.

offering the spark perforated tape for sale at that time.

We conclude that there was, as found by the district court, no evidence that the combination and method claimed by Gill were in public use before March 30, 1949. Moreover, there was not sufficient evidence that the tape alone was on sale before that date.

C. *Non-infringing use of tape.*

Appellants contend there are substantial uses for the spark perforated tape which do not result in infringement and argue three legal consequences arise: (1) National's sales of the tape do not make it liable as a contributory infringer under 35 U. S. C. § 271(c); (2) U. S. G. is guilty of misuse because an unspecified portion of the price it charges for every roll of tape is a royalty for use under the patent; and (3) U. S. G. is not entitled to damages based on all sales of tape.

The uses which are said not to involve infringement are as follows: (1) A great quantity of tape is applied with an Ames tool or similar device. During such application, one side of the tape is coated with cement before it comes in contact with the wallboard. It is claimed that the perforations are clogged before such contact and therefore do not "permit the escape of air entrapped beneath said strip during its application to said joint. . . ."[20] (2) Some tape is used where there is no joint between adjacent wallboards, *i.e.*, to repair a gouge or crack, and to extend the surface of the wallboard to obtain a close fit around pipes, outlets, fixtures, and the like.

Somewhat similar contentions were advanced on the first appeal, were decided against National, albeit without discussion in the opinion, and were not included among the issues to be decided on remand.

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20. The phrase, "during its application to said joint", appears in claims 2, 3, and 4, but not 1 nor 5.

In any event, the record makes it clear that uses under (2) are incidental to the use for which the tape is purchased, and which is protected by the patent, and too insubstantial, relative to the amount of tape sold, to prevent National's liability as a contributory infringer or to be a basis for a claim of misuse. There was testimony that the amount used under (2) "wouldn't exceed the amount of tape that would normally be wasted." When damages are determined, consideration may be given to such uses in accordance with and as may be appropriate under any showing made as to their extent.

The quantity of tape applied by means of the Ames tool or similar device is surely very substantial. But we are not persuaded that when the tape and cement come in contact while the tape is passing through the tool immediately before contact is made with the wallboard, the escape of entrapped air through the perforations in the tape cannot be said to occur "during its application to said joint." We conclude that infringement would result whether the application is made by use of the Ames or similar tool or not.

The judgment appealed from is affirmed.

IN THE UNITED STATES DISTRICT COURT.
* * (Caption—59-C-896) * *

SUPPLEMENTAL FINDINGS OF FACT AND CONCLUSIONS OF LAW.

Trial of this cause having been had from December 11, 1963, to February 26, 1964, and a decision having been rendered by this Court on December 7, 1964, holding the patent in suit valid and enforceable, but not infringed, all parties thereafter having taken appeals to the Court of Appeals for the Seventh Circuit, said Court having held, in an opinion rendered October 2, 1967, that the patent in suit was infringed and that there had been no misuse thereof, and having affirmed the dismissal of defendants' antitrust counterclaims, and having remanded the cause to this Court with directions to consider and determine two issues concerning validity of the patent, namely, (1) whether the subject matter of the patent satisfies the test of invention set forth in Title 35, United States Code, Section 103, and (2) whether the subject matter of the patent was in public use more than one year prior to March 30, 1950, by anyone using spark-perforated wallboard joint tape allegedly produced by others than plaintiff, and this Court having heard the arguments and read the briefs of counsel for the parties relative to the scope of the remand and procedures to be followed thereunder, having entered a post-remand order governing further proceedings, herein, and having received the proposed findings of fact, conclusions of law and related briefs filed by the parties pursuant to said order and having considered the same in the light of the opinion and mandate of the Court of Appeals, this Court now makes the following findings of fact and conclusions of law to supplement those expressed in its opinion of December 7, 1964, and the October 2, 1967, opinion of the Court of Appeals:

Findings of Fact.

(1) The patent in suit, United States Patent No. 2,749,267 to J. W. Gill, contains five claims, the first of which is directed to a combination and the other four to methods. All claims concern the art of producing smooth, seamless joints in walls made of wallboard. Walls made of wallboards are generally referred to as "drywall construction."

(2) Claims 1 and 5 of the Gill patent are as follows, claim 5 being treated as representative of the method claims (PX 1, col. 6):

> "1. The combination with wallboards attached to a support and having edges in substantially abutting relationship forming a wallboard joint, of a strong thin cellulosic strip having perforations throughout with diameters from about 0.02 inch to 0.002 inch, said strip being adhesively secured over said joint and the edges of said wallboards adjacent thereto."
>
> "5. The method of covering the joint between adjacent wallboards which comprises adhesively securing over said joint a strip of strong paper provided with substantially uniformly arranged spark-produced perforations having diameters from about 0.02 inch to 0.002 inch to permit the escape of air entrapped beneath said strip while substantially preventing the escape therethrough of adhesive employed to secure the strip in place."

(3) Drywall construction is presently used in over 70 percent of residential construction. Large sheets of wallboard are nailed to studding to form interior walls. Where two sheets join, the industry has for a long time used a cement or "mud" and strips or tapes of bridging material such as cloth, metal, or paper. Machines are widely used to apply the tape. Those machines generally apply the cement to the back of the tape just before the tape is placed along the joint. Later, a top coat of cement is applied to

make the joint smooth and indistinguishable from the rest of the wall.

The Section 103 Issue.

(4) Prior to the Gill invention, several types of wallboard joint tape had been used, each of which had serious shortcomings and met with varying difficulties.

(5) The principal prior art relied on by defendants as invalidating the Gill patent was defendant National's Crandell patent No. 2,064,785.

(6) This Crandell patent was applied for in 1936. It is directed to covering a wallboard joint with unperforated, tightly woven balloon cloth fabric tape "saturated throughout with a strong, tough and elastic waterproof glue, such as casein glue" (col. 2, lines 32-33). One of its stated objects is "the formation of a joint that will not breathe" (col. 1, lines 53-54). The specification also explains that the cloth tape is soaked in glue "substantially impermeable to air and moisture" (col. 3, lines 7-8) before being placed over the joint. Both claims of this patent call for the attachment of a woven fabric tape to the edges of adjacent wall panels "by means of an elastic glue substantially impermeable to air and moisture . . . permeating said tape throughout."

(7) In the proposed manner of applying balloon cloth tape, the patentee, Crandell, was not concerned with either preventing the exuding of joint cement through the tape or permitting the passage of air therethrough.

(8) The Crandell patent and National's 1936-1937 advertising literature on balloon cloth tape were devoid of any suggestion that wallboard joint tape should permit air entrapped beneath the tape to escape through the tape while preventing the escape of cement therethrough.

(9) The teaching of the Crandell patent that the tape is "impermeable to air" is directly contrary to the teaching

of Gill that the tape should be perforated to permit passage of air through perforations which are of sufficiently small size to prevent the passage of cement therethrough.

(10) Balloon cloth tape to cover wallboard joints was unsatisfactory for a number of reasons:

(a) Balloon cloth was just cloth, and there were no perforations in any tape made from it.

(b) Balloon cloth tape was highly incapable of passing air through it while at the same time preventing the passage of cement.

(c) The only attempted use of balloon cloth tape shown by the evidence resulted in extensive blistering.

(d) Balloon cloth tape did not properly adhere to the adjacent edges of wallboards.

(e) Balloon cloth tape had high stretch.

(11) Defendants submitted no evidence of any installations involving the use of balloon cloth tape, and produced no records of any sales of such tape.

(12) Defendant National's vice-president Crandell, the patentee of the '785 patent, testified in response to questions by the Court that "blisters were unknown with this type of tape." That the opposite was true was subsequently established by uncontradicted and unchallenged evidence introduced through plaintiff's rebuttal witness Bloedel.

(13) Only one job was ever identified where an attempt had been made to use balloon cloth tape, this being during construction in 1937 of an apartment building in Dallas, Texas. The evidence relative thereto was introduced by plaintiff. Photographs taken under the direction of the witness Bloedel shortly after this use of the tape (PX 613-16), and a contemporaneous memo by this witness dated May 10, 1937, describing the resulting joints (PX 612), together with his testimony, established that numerous blisters formed over air pockets behind the balloon cloth tape.

(14) The witness Bloedel, although having been connected with plaintiff many years ago, appeared to be impartial. He had had no connection with either plaintiff or defendants for more than 20 years at the time he testified. His testimony was corroborated in important respects by documentary evidence and appeared to be credible and trustworthy.

(15) Not later than 1938, defendant National abandoned its promotion of balloon cloth tape in favor of punch-perforated paper tape.

(16) A prior art joint tape that was used extensively for a while was metal tape provided with large perforations as disclosed in the Green '667 patent, the application for which was filed in 1927. The perforations allowed the cement in which the tape was embedded to exude through them, providing a mechanical key that supplemented the otherwise inadequate bond. The mechanical keys had to be buffed down or sanded before a smooth top coating of cement could be applied. This tape had disadvantages which outweighed its advantages.

(17) Paper wallboard joint tapes largely supplanted the earlier tapes used in the treatment of wallboard joints. Such paper tapes, having punch perforations about 1/16" in diameter, are shown in two file wrapper references, namely, the Page et al. '433 patent and the Speer '523 patent. Applications for these patents were filed in 1937 and 1941, respectively. The use of punch perforated paper joint tape was subject to many disadvantages, among which were the following:

(a) The cement exuded through the perforations, necessitating the additional step of removing the projecting cement by scraping, sanding or buffing before the second or finishing coat could be applied.

(b) The large perforations often caused the pattern of holes to show in the finished wall.

(c) Paper burrs were frequently left attached to the tape as a result of the punching operation and were likely to cause imperfections in the covering coats of cement.

(d) The punching dies required extensive and costly maintenance.

(e) When the punch-perforated tape was applied by means of taping machines, the cement extrusions seriously interfered with the proper operation of the taping machines.

(18) The purpose of having large (*e.g.* 1/16" diameter) perforations in wallboard joint tape of the prior art was explained in the Speer '523 patent as being to "permit the escape of air from between the tape and the wallboard and eliminate the formation of air pockets" (col. 3, lines 6-9) so that when such perforated tape was applied, it was "free from wrinkles and blisters" (col. 3, line 54).

(19) Another example of prior art wallboard joint tape is plain, unperforated paper tape as shown in the Page '982 patent, the application for which was filed in 1934. However, it was recognized by this in the industry that the use of such tapes resulted in blisters. When plain tape was used, air entrapped beneath the tape interfered with proper embedding and bonding of the tape and, upon application of a second coat of cement over the tape, blisters were formed.

(20) Defendant's witness Walter Mackey confirmed the fact that plain tape "didn't stick and that air trapped" and that the idea of perforations was to "let the air out."

(21) All wallboard joint tape patents relied on by defendants except the Crandell '785 patent were file wrapper references considered by the Patent Office in determining that the claims of the patent in suit were patentable.

(22) None of the four file wrapper references disclosing joint tape, namely, Green '667, Page et al. '433, Page '982 and Speer '523, contains any suggestion that wallboard

joint tape should have perforations formed therein that would permit the escape of air entrapped beneath the tape while preventing the escape of cement therethrough.

(23) None of these four file wrapper references disclosing joint tape suggests that forming perforations in the tape of the size taught in the Gill patent would overcome the deficiencies of the prior art tapes.

(24) The Crandell '785 patent is less pertinent than the wallboard joint tape patents cited by the Examiner against Gill.

(25) Defendants tendered the following United States patents showing the process of spark perforation:

Meaker	No. 2,340,546
Meaker et al.	No. 2,388,069
Meaker	No. 2,372,508
Meaker et al.	No. 2,550,366
Roos	No. 1,914,345
Wilsey et al.	No. 2,385,246

These patents variously refer to or disclose methods and apparatus for producing spark perforations in valve bags for dry cement, plastic bags, metal foil sheets, and flour bags. None of them contains any teaching or suggestion concerning wallboard joint tape, its production or its use.

(26) When application was first made in the Patent Office for the Gill patent, the Examiner's prior art search resulted in the citation of the spark perforation patents to Meaker '546, Meaker et al. '069, Meaker '508 and Roos '345. In Gill's continuation application upon which the patent in suit was granted, a second Examiner's search of the prior art again resulted in the citation of the two most pertinent spark perforatiaon patents, namely, Meaker '546 and Roos '345.

(27) The Meaker et al. '366 and Wilsey et al. '246 patents are less pertinent than the spark perforation patents which were cited by the Patent Office against Gill.

(28) For many years prior to the Gill invention, nu-

merous inventors, including National's Research vice-president Crandell, had attempted to advance the art of taping wallboard joints, as shown by the various prior art tape patents, and skilled persons in the research departments of companies such as plaintiff and defendant National had worked continually on this problem. Also, as shown by the spark perforation patents of the prior art, spark perforating and apparatus for forming spark perforations had been known since at least as early as 1931. The record is devoid of any evidence that anyone prior to Gill suggested employing wallboard joint tape having spark-produced perforations therein which would permit the escape of air through the tape while preventing the escape of cement therethrough.

(29) The use of wallboard joint tape having minute spark-produced perforations to conceal wallboard joints as covered by the patent in suit permits the escape of air entrapped beneath the tape, but substantialy prevents the escape of joint cement used to secure the tape in place. This was an entirely novel concept for solving the wallboard joint taping problems that existed prior to the Gill invention, and was in no way suggested by the prior art adduced by defendants.

(30) The use of the Gill spark-perforated wallboard joint tape overcame the following deficiencies and difficulties, among others, which attended the use of the prior art joint tapes:

(a) It eliminated the necessity for buffing, sanding or scraping nodules of joint cement protruding from the outer surface of the tape, as was required when punch-perforated tape was used, thereby substantially decreasing the time required for, and the cost of, tape application.

(b) It substantially eliminated the entrapment of air beneath the joint tape which caused blisters and

prevented proper adherence of the tape when unperforated tape was employed.

(c) It prevented the pattern of perforations or "show through" from appearing in the finished wall, as often happened when punch-perforated tape was used.

(d) When the Gill tape was used in taping machines, the joint cement did not pass through the spark perforations and interfere with the proper functioning of the machines, which commonly occurred if punch-perforated tape were used in them.

(e) The Gill spark-perforated tape was free of burrs and tabs which often remained attached to punch-perforated paper tape, particularly when the punches were not kept extremely sharp. The frequent sharpening of the punches was costly, and the burrs made it difficult to achieve a smooth surfacing of cement when the tape was applied.

(31) In the practice of the Gill invention, the proper embedding of the joint tape in the joint cement, without the formation of any cement nodules on the surface of the tape away from the wall and with substantially no air pockets or blisters, is assured under normal or even adverse conditions encountered in everyday wallboard joint taping operations.

(32) The Gill invention was not obvious to wallboard joint tape applicators, these being persons having ordinary skill in the art.

(33) The Gill invention was not obvious to Mr. Crandell or to defendant National's other skilled research personnel who worked on the problems connected with the use of wallboard joint tapes, to National's other employees who produced and sold the tapes, or to National's field personnel who observed the use of wallboard joint tapes in the field.

(34) The Gill invention was not obvious to the experts

of the Patent Office who examined the Gill application and determined this very issue in granting the patent over the best prior art.

(35) Various types of wallboard joint tapes were manufactured, sold and promoted by defendant National. At an early date, it sold perforated metal tape such as that disclosed in the Green '667 patent. Subsequently it sold unperforated paper tape. Prior to 1935, Mr. Crandell, in an effort to improve wallboard tape and the resulting joints, conceived the balloon cloth tape system covered by the Crandell '785 patent. During the period 1935-1937, National attempted to promote the use of this tape. On the only job as to which there was actual evidence of an attempted application of balloon cloth tape, the result was a complete failure, due primarily to the large number of blisters caused by air trapped beneath the tape. The attempted promotion of balloon cloth tape was thereafter abandoned. Following this, National adopted and promoted the sale of punch-perforated paper tape, along with its plain paper tape, and this was the situation at the time of the Gill invention.

(36) In 1950, shortly after plaintiff placed the Gill spark-perforated tape on the market, National acquired and forwarded samples thereof to its Research Laboratory for evaluation. National's skilled research personnel Buergin, Teale and Elden, after examining plaintiff's "electro-perforated 'Perfa-Tape'," stated that when dampened this tape "will prevent the passage of air" and erroneously concluded that it "holds no advantage over a solid tape." (PX 528.)

(37) Simultaneously with its tests of plaintiff's spark-perforated tape, National's Research Department was unsuccessfully attempting to produce a competitive wallboard joint tape with perforations that would prevent the passage of cement but through which air could pass. National's research personnel tried using small punches but found

"that dies with such small projections would break more easily than the present dies thus increasing operating costs," and that during application of the resulting tape to gypsum boards the joint cement still extruded through the perforations. From these tests, they concluded that there was no advantage in the small perforations because "the smaller holes are more expensive to punch and do not eliminate the cement nodules." They recommended instead that the number of perforations in the center row or rows of National's then current punch-perforated tape should be eliminated in order to reduce cement extrusion.

(38) While National's Research Department failed to appreciate the advantages resulting from the use of plaintiff's spark-perforated tape, the applicators in the field used it to such an extent that by 1952 National's Sales Department desired "to eliminate the plain tape and sell the Spark Perforated Tape." About July 10, 1952, the Production Department of National was instructed to begin producing spark-perforated tape and to discontinue the manufacture of plain tape, although it was realized that the spark-perforating step might increase the cost of production as much as 18 percent.

(39) After marketing its spark-perforated tape for a while, National increased the number of perforations per inch to make its tape indistinguishable from plaintiff's commercial product. Since then, National has continued to manufacture such spark-perforated tape and to promote its use to form wallboard joints.

(40) The combined production of spark-perforated tape by plaintiff and defendant National, in the seven years preceding trial, was over eight billion feet. National's vice-president Crandell admitted that he was aware of the large demand for spark-perforated tape "as any man would be in our business."

(41) No one skilled in the art testified that the subject matter of the Gill invention was obvious at the time the invention was made.

(42) In view of the level of skill demonstrated by the prior art patents tendered by defendants, the Patent Office Examiner was correct in determining that the subject matter of the claims at issue was not obvious to one skilled in the art.

(43) The Gill invention, at the time it was made, was not obvious to persons of either ordinary or extraordinary skill in the art.

The Prior Public Use Issue.

(44) The prior public use issue turns upon whether or not the combination or method claimed in the Gill patent was publicly used prior to March 30, 1949, which was one year prior to Gill's filing date.

(45) The only prior public use issue open for consideration and determination by this Court on remand is that involving the activities of the W. L. Mackey Company.

(46) There was no evidence whatsoever that any spark-perforated tape produced by the W. L. Mackey Company was used in forming wallboard joints prior to the critical date of March 30, 1949.

(47) Defendants admitted that they knew of no construction in which Mackey spark-perforated tape had been used.

(48) Defendants stated in their post-trial brief (p. 36), "It was obviously not worthwhile to try to find homes built 12-15 years earlier and attempt to tie them to Mackey's spark-perforated tape."

(49) Not only was no use shown of the claimed combination or method, but the evidence failed to establish that there was so much as a single sale of spark-perforated tape by the Mackey Company until long after March 30, 1949.

(50) No record of the Mackey Company referred to any sale of spark-perforated tape prior to the critical date of March 30, 1949. The earliest reference to spark-perforated tape was an entry dated January 6, 1950, in the Mackey Company sales ledger relating to Wesco Water Paints Company, the principal customer of the Mackey Company. This entry included a designation "SS" which defendants' witness Walter Mackey said meant "special spark." No earlier entry identified spark-perforated tape. The date of January 6, 1950, was seven months after plaintiff had begun marketing its spark-perforated tape in the Mackey Company area.

(51) The records of the Wesco Company, the purchaser for resale of most, if not all, of the wallboard joint tape produced by the Mackey Company, showed no purchases from the Mackey Company or sales to others of spark-perforated tape prior to January 6, 1950.

(52) The references in the Mackey Company records to "beveled" tape sold to Wesco did not identify spark-perforated tape. The "beveled" tape entries dated back to 1943, several years before Walter Mackey claimed to have made any spark-perforated tape, and did not identify tape other than as having beveled edges.

(53) No specimens or samples of any alleged Mackey spark-perforated wallboard joint tape were produced at trial.

(54) Defendants did not produce at trial any of the equipment allegedly used by Walter Mackey or the Mackey Company to spark-perforate wallboard joint tape, or any records of acquisition of such equipment.

(55) There was no evidence that any tape made by Walter Mackey or the Mackey Company prior to 1950 had the ability to permit the escape of air from beneath the tape while substantially preventing the oozing of joint cement therethrough.

(56) Although defendants' witness Walter Mackey testified that in 1948 he showed to others samples of spark-perforated tape made by Everett McNulty, one of his employees, only Mr. Pine of Wesco admitted seeing a sample of such supposedly spark-perforated tape. Mr. Pine testified that he "was not impressed with the tape at all" and he thereafter discarded it. There was no public use of the tape by Pine.

(57) McNulty and Mackey testified that the equipment on which the samples given to Pine were allegedly made was not satisfactory.

(58) There was no evidence that the perforations in any spark-perforated tape allegedly made by the Mackey Company prior to 1950 had diameters within the range of 0.02" to 0.002".

(59) Defendants did not attempt to negate the likelihood that if Mackey made any spark-perforated tape prior to the critical date of March 30, 1949, the perforations would have been substantially smaller than 0.002" because of the crude equipment allegedly used by Mackey, and therefore such tape, if used, would have prevented the escape of air from beneath the tape, instead of permitting it as taught by the Gill patent.

(60) No record, document or other writing of the Mackey Company, the Wesco Company, or any purchaser from either of said companies, referring in any way to the development, purpose or use of spark-perforated tape, or to the purchase, construction or use by the Mackey Company of any equipment or apparatus for making such tape, was produced. The testimony of Walter Mackey and Everett McNulty concerning the alleged production of spark-perforated tape by the Mackey Company prior to March 30, 1949, was based solely on their recollection of events that assertedly occurred more than ten years prior to the time when the testimony was given.

(61) No one at Wesco was informed that any wallboard joint tape sold by the Mackey Company prior to January 6, 1950, was supposed to have fine perforations, and no purchaser from Wesco was so advised.

(62) Defendant National acquired Wesco in 1952 and took over its records. Therefore defendants were in the most advantageous position to produce evidence, if there were any, of the existence or use of spark-perforated wallboard joint tape allegedly sold to Wesco by the Mackey Company.

(63) Every statement in the following conclusions of law which may be deemed to be a finding of fact is supported by the evidence.

Conclusions of Law.

1. The differences between the subject matter patented in the Gill patent in suit, No. 2,749,267, and the prior art are such that the subject matter as a whole was not obvious at the time the Gill invention was made to a person having ordinary skill in the art to which such subject matter pertains. The subject matter of the patent in suit therefore satisfies the test of invention set forth in Title 35, United States Code, Section 103.

2. The subject matter claimed in the patent in suit was not in public use more than one year prior to March 30, 1950.

3. A patent shall be presumed valid. The burden of establishing invalidity rests on the party asserting it. Title 35, United States Code, Section 282.

4. Defendants have not discharged their burden of proof on either of the issues upon which the Court of Appeals remanded the cause to this Court.

5. The Gill patent in suit, No. 2,749,267, is good and valid in law.

6. Plaintiff is entitled to judgment on its complaint.

7. Every statement in the foregoing finding of fact which may be deemed to be a conclusion of law is a proper conclusion of law.

James B. Parsons,
United States District Judge.

Dated: February 24, 1969.

IN THE UNITED STATES DISTRICT COURT.

* * (Caption—59-C-896) * *

Before the Hon. James B. Parsons, Judge.

December 7, 1964,
3:00 o'clock, p.m.

The Court: The parties may wish to remain seated because it will take me a few minutes to read into the record my ruling. The reason I am reading into the record the ruling is because it is the result of work up to and including the last minute and I have not had an opportunity to have it typed for me for counsel, but at the same time, also I intend to ask counsel to submit the proposed findings of fact and conclusions of law before I do a final memorandum in the matter and for that reason I am reading it into the record.

In the course of trying a protracted and difficult patent case, the Court is ever attended by the admonition that patent rights are matters concerning far more than the interests of the adverse parties. They involve issues of great public interest. *Hi-Lo TV Antenna Corp.* v. *Rogers, et al.*, d/b/a Midwest Naturlite Co., 274 F. 2d 661, Seventh Circuit, a 1960 case.

The patent system, through the promotion of useful and important inventions, constitutes a prominent factor in the development of the American way of life. At the same time, it is one of those rare but substantial departures from the common law prohibition against monopolies.

Here I rely from time to time fortunately upon the kindness of defendants to allow me a rather complete statement of facts and some rather interesting language. I do not call it plagiarism from this perspective but, nevertheless, I do acknowledge that this is in part from Page 1 of the defendants' brief.

The design of the patent laws is to reward those who make some substantial discovery or invention which adds to our knowledge and makes a step in advance in the useful arts. Such inventors are worthy of all favor.

At the same time, it was never the object of those laws to grant a monopoly for every trifling device, every shadow or shade of an idea. Citing *Atlantic Works* v. *Brady,* 107 U. S. 192, an 1883 case.

With never the idea of compromising the divergent positions of the contestants, the trier of fact in these cases must never lose sight of the duty of balancing these two extremes in the fundamentals of a modern society to the end that detriments to society inherent in the giving away of one be doubly weighted by the advantages attained by society in the other. The instant case, I think, is a classic example of the extreme to which this balancing play can be put.

This suit involves the validity of United States Patent 2,749,267 granted to Joseph W. Gill and Charles Raisel Southwick and assigned to the United States Gypsum Company, and the alleged infringement of that patent by National Gypsum Company and an ultimate used of the same or a similar type of tape by the name of Plaza Plastering Corporation.

To keep the record straight, I here reiterate that this court has jurisdiction over the parties and the subject matter of the suit, that I reaffirm my memorandum and order heretofore entered and attach hereto as Appendix I, denying defendants' motion for summary judgment and, in accordance with my memorandum filed herein, and attached hereto as Appendix II, I herewith enter my order dismissing defendants' counterclaims. The case has gone to trial on the complaint and answer. Witnesses testifying over many days have been heard attentively, hundreds of exhibits admitted into evidence have been studied carefully, designated portions of depositions, running into thousands

of pages, have been read and reread, briefs and oral arguments have been studied and considered in their entireties. I am prepared to decide the case.

The patent in issue, Gill, et al., -267, is one of a number of patents which have been issued during this century concerning the dry wall industry, and in particular Gypsum wallboard and related products. Wallboard has found great acceptance as an economical alternative to lath and plaster interior wall construction. It has been estimated that wallboard is used in approximately 70 per cent of the homes built in America today.

Gypsum wallboard is manufactured primarily in 4-foot widths in lengths up to 16 feet. The parties to this suit are the leaders in the industry. Normally, wallboard is hung at the job site by being nailed to wood studding or supports. In manual application, a smooth, noninterrupted surface is provided by filling the space or joint between adjacent wallboards with cement or other similar adhesive. Applicators refer to this substance as the "mud". This substance, however, would be ineffective were it not for the use of some bridging material, cloth, metal, paper, etc., in strips, which, attaching because of the "mud" to abutting edges of adjacent wallboard, holds them together into a continuous wall surface. This bridging material, generally now a tape, usually is applied through tools, such as one called the Ames tool, already coated with the adhesive cement. In either the manual or the automatic operation, the tape is applied to span the joint and is imbedded in the cement with a trowel or knife to insure the performance of the filler. A top coat of cement is applied over the tape, once the tape has bonded, and then this top coat is "feathered" out to present a smooth surface. Usually the abutting edges of wallboard are sufficiently recessed to accommodate to a smooth surface the tape and cement, and aiding in this accommodation, recent tapes have "beveled" edges.

If there is a gap in the first coat of cement, the application of the top coat may cause the tape to bubble or blister, thereby creating an irregularity or bump on the completed wall surface. It is to remedy this situation that Gill, et al. -267 purportedly is directed. Much of this description of this type of wall construction is borrowed by the Court from defendants' briefs.

In a single sentence, the Gill patent is a process of tape application utilizing a tape perforated by electric sparks with holes large enough to permit the escape of entrapped air, but small enough to prevent the escape of the cement.

The use of tape to cover the crack between adjacent sections of wallboard is almost as old as the use of wallboard itself. In the 1920's, a strip of loosely-woven cloth was applied with a casein base adhesive. Taping contractors next turned to a metal tape having holes approximately 1/16 inch in diameter. In 1936, National Gypsum began selling a tape referred to as "balloon cloth tape", having approximately 25,000 holes per lineal inch, ranging in size from .002" to .02" in diameter. These early cloth tapes proved unsuccessful because they had low transverse tensile strengths and high stretch, permitting ruptures and cracks to form in the decorative coatings.

Smooth metal tape did not bond well with the adhesives then in use. To rectify this problem, metal tape was then supplied with large holes which allowed the cement to excude through them, providing thereby a mechanical key, which supplemented the otherwise inadequate bonding strength. This tape had disadvantages which outweighed its advantages. The mechanical "keys" had to be buffed down before a top coating could supply a smooth finish.

In the late 1930's, paper of improved transverse strength became available and replaced metal tape. United States Gypsum patented a paper tape patterned after the perforated metal tape—a punch perforated tape which, except

for the disadvantages of the "keying" effect experienced with the metal tape, was a substantial step forward in the industry.

In the 1940's, with the development of the speed applicator, the automatic taping machine, the problem of the oozing of cement through the 1/16" punched holes of the tape became a serious problem to the demand for increased speed in wallboard construction. And in the Ames Taping Tool developed by one Stanley Ames, in which the tape is fed through a "mud box" where a layer of cement is placed on the down side of the tape, and the tape is then rolled out directly on the joint to be covered, the cement exuded through the punched holes before the tape was applied, and created an undesirable messy operation.

Ames and others began calling for a tape-paper tape—without the holes. The W. L. Mackey Company began supplying a plain, unperforated paper tape. Plain tape went into widespread use. In the meantime, spark perforation of paper was being worked on for various uses. Even United States Gypsum obtained a patent on a wall construction involving a covering containing perforations produced by small electric arcs. A Californian, one John W. Meaker, obtained a patent on spark perforation of paper, and in late 1947, offered to assist United States Gypsum in developing a paper with spark perforations. A Mr. Wilsey soon obtained a patent for spark perforating a paper used in making bags and packages.

In the meantime, Dr. Joseph W. Gill, the head of Research Engineering at United States Gypsum, began himself experimenting with the development and use of a spark perforated paper for taping wallboard joints. By late 1947, he had developed a spark perforated paper which he felt would best meet the needs of the industry. Apparently, National Gypsum was working on the idea at about the same time, though there is imposing evidence that

National never did itself seek to develop this tape, but rather, and later in 1952, acquired the interests of a Wesco Water Paints Company, which had developed but not patented a spark perforated tape.

Dr. Gill's trouble came with developing a machine which could manufacture his tape in commercial quantities and with economy. Late in 1947, he presented his problem to USG's project engineer, a Charles Southwick, who finally developed a machine. In 1950, application was filed jointly by Gill and Southwick for a patent on the machine and the tape. This application was rejected. A new application was filed, and it eventually was abandoned in June of 1956, after a patent was issued on a continuation of the 1950 application, which now embraced the process of applying a spark perforated tape to wallboard construction. It was a combination or method patent. It did not cover the machinery at all. Accidentally, and the Court is convinced that it was purely and simply an inadvertence, Southwick's name was left on the continuation and he appeared as joint inventor with Dr. Gill on the patent which eventually did issue. If the patent in suit is an invention, this harmless and unintended error should be corrected.

The two claims of the patent in suit which are material to this litigation read as follows:

> "1. The combination with wallboards attached to a support and having edges in substantially abutting relationship forming a wallboard joint, of a strong thin cellulosic strip having perforations throughout with diameters from about 0.02 inch to 0.002 inch, said strip being adhesively secured over said joint and the edges of said wallboards adjacent thereto.
>
> "5. The method of covering the joint between adjacent wallboards which comprises adhesively securing over said joint a strip of strong paper provided with substantially uniformly arranged spark-produced perforations having diameters from about 0.02 inch to 0.002 inch to permit the escape of air entrapped be-

neath said strip while substantially preventing the escape therethrough of adhesive employed to secure the strip in place."

The evidence shows that at least as early as 1952 the defendant National Gypsum had available to it a form of spark perforated tape, and began sale of it subsequent to that date.

Two factors are important about National's dealing in spark perforated tape. (1) National's indemnification agreements in evidence, made with ultimate users of its spark perforated tape, are dated December 2, 1957, June 17, 1958, and June 16, 1959, all of which dates are subsequent to the issuance of the Gill patent. And (2) the spark perforated tape made and sold by National differs in major matters from that manufactured and sold by United States Gypsum pursuant to its patent. This matter will be discussed at this time, for I think it is exceedingly important to this case. I realize that since it would seem that infringement presupposes validity, that validity should be determined first. However, this pretermits the language of Paragraph 1 of Title 35, United States Code, Section 282. Logic, together with the inherent burden on the plaintiff on the issue of infringement, even without indulging in a presumption of validity, dictates the determination of this issue first. *Automatic Arc Welding Co.* v. *A. O. Smith Corp.*, 50 F. 2d 740, 742, a Seventh Circuit case which supports me in that approach. If there is no infringement, the question of validity need be reached only as an accommodation to the public that the ghost of that issue be disposed of. *Marasco* v. *Compo Shoe Machinery Corp.*, 325 F. 2d 695, and other cases cited. See also, *Sinclair & Carroll Co.* v. *Interchemical Corp.*, 325 U. S. 327, 330 (1945). Accord, *W. R. and John Barnes Co.* v. *International Harvester Co.*, 51 F. Supp. 254 (N. D. Ill. 1943); *Barry* v. *General Tire and Rubber Co.*, 31 F. Supp. 879 (N. D. Ill. 1940); *Langsett* v. *Marmet Corp.*, 231 F. Supp. 759 (W. D. Wis. 1964).

There is no doubt about the fact that this is a narrow art, and each invention within it necessarily must be narrowly limited to the closest boundaries of the claims, as they are read in the light of the specifications. It is well established that in this type of art, patent infringement exists only when the accused device and the teachings of the patent in suit are substantially identical in structure, mode of operation and results accomplished. *Graver Tank & Mfg. Co., Inc.* v. *Linde Air Products Co.*, 339 U. S. 605, 607, 608-610 (1950). *Universal Match Corp.* v. *New Castle Products, Inc.*, 308 F. 2d 842, 846 (7th Cir. 1962); *Schirbatskoy* v. *United Steel Corp.*, 287 F. 2d 552, 558 (7th Cir. 1961).

In order to decide whether there is an infringement of a patented device, it is necessary to determine which portions of the patented device really do the work. Indeed, a device which is merely within the lessons of the prior art does not thereby infringe, for the mere reading of claims of a patent in suit upon an accused structure or method does not and cannot, in a narrowly construed patent, connote infringement unless there is functional and compelling equivalency. *Casco* v. *Sinko*, 116 F. 2d 119 (7th Cir. 1940), cert. denied, 312 U. S. 693; *Apex* v. *Maytag Co.*, 122 F. 2d 182 (7th Cir. 1941), cert. denied, 314 U. S. 687; *Hall* v. *Montgomery Ward & Co.*, 57 F. Supp. 430 (N. D. W. Va. 1944). Even the mere application of claim phraseology, or the word by word correspondence, is not alone enough to establish infringement. *Flowers* v. *Austin-Western Co.*, 149 F. 2d 955, 958 (7th Cir. 1945). *Independent Pneumatic Tool Co.* v. *Chicago Pneumatic Tool Co.*, 194 F. 2d 945, 947 (7th Cir. 1952); *North Star Ice Equipment Co.* v. *Akshun Mfg. Co., et al.*, 301 F. 2d 882, 886 (7th Cir. 1962). Certainly, where the basis of an invention lies in a critical relationship of parts represented by mathematical formula, embodied in the claims in suit, they will be held not to be infringed by a structure in which the parts do not bear critical relationship to each other. *Mackay Radio &*

Telegr. Co. v. *Radio Corp.*, 306 U. S. 86 (1939). *National Bronze & Aluminum* v. *Permold*, 111 F. 2d 69, 70-71 (6th Cir. 1940). *Industrial Instrument Corp.* v. *The Foxboro Company*, 307 F. 2d 783 (5th Cir. 1962); *Stewart Warner Corp.* v. *Lone Star Gas Company*, 195 F. 2d 645 (5th Cir. 1952).

In the case at bar, the plaintiff claimed and assumed that it had proved that defendant Plaza Plastering Company had directly infringed the Gill, et al., patent by using National's spark perforated tape in the claimed method and combination. Defendant National was charged with actually inducing Plaza and others to infringe by using National's spark perforated tape. In each instance, it was incumbent upon the plaintiff to show by clear and unequivocal evidence that the tape made and sold by National conformed to the description of the tape element set forth in the claims of the Gill, et al., patent. As stated above, in a combination or method claim in a crowded art, every element or step is deemed essential, and the omission of a single important element precludes infringement. *Rowell* v. *Lindsay*, 113 U. S. 97, 102 (1885). *Power Curber, Inc.* v. *E. D. Etnyre & Co.*, 298 F. 2d 484, 494 (4th Cir. 1962); *Guide* v. *Desperak*, 249 F. 2d 145, 147 (2d Cir. 1957).

In the Power case, the Court said:

> "The patent in suit is a combination patent and to establish infringement the plaintiff must show that every essential element of the combination, or its equivalent, is embodied in the accused machine. However, since every element of the plaintiff's combination is old and known to the prior art, infringement is avoided if any essential element of the combination, or its equivalent, is omitted by the defendants. See the recent decision of this court in *Entron of Maryland, Inc.* v. *Jerrold Electronics Corporation*, 295 F. 2d 670 (4th Cir. 1961), and cases therein cited."

Plaintiff asserts the importance of perforated tape in the claimed method and combination in performing the func-

tion of letting the air escape. Assuming without here deciding that plaintiff's tape does just that, there is no proof whatsoever that National's tape does just that. To the contrary, the claims quoted above require that the perforations be "throughout" the paper.

Presumably, the perforating electrodes are, for the plaintiff, set so that perforations occur all over the tape, from edge to edge, including the parts that are beveled. I speak here not of plaintiff's tape in evidence. I speak of the representations of the patent. I am not convinced that plaintiff's tape in evidence follows strictly the Gill, et al., patent, or that it would be Gill tape, as I have limited Gill in its application. Of this I am convinced and beyond a reasonable doubt. An examination of National's tape revealed to me, clearly and unequivocally, that the perforations were concentrated in the center half of the tape, and that the edges were relatively free of perforations. There is no reason to suppose that air would be any less trapped in the outer quarters of the tape than in the inner half, since the spreading or smearing process of application would have a smothing effect upon the whole of the tape. In fact, as I watched the experiments on the controlled device presented by the defendant, I was convinced that if entrapped air would likely occur, it would more likely occur on the outer quarters of the tape than on the inner half, since there was at all times an excess of cement which had an outward and downward movement as the blade swept across the tape.

Paul B. Myers, an employee of United States Gypsum, given the task of analyzing the tape manufactured by National, testified as follows:

> "Q. Then do I understand that the perforations were found only in the center approximately half of the tape?

A. I guess I—I shouldn't say 'I guess'—I think the majority of those would be within the, about the center half, yes, sir.

Q. So there were none in the outer half-inch on either side?

A. No, sir, I could not say that there were none there. As a matter of fact, this particular sample I just held up to the light does have some one or two, or a very small number out within the half inch of the edge.

Q. But for all practical purposes, they were concentrated in the center half rather than being throughout the paper?

A. For practical purposes, yes, sir."

Claim 5 of the Gill, et al., patent calls for a tape having uniformly arranged perforations. An analysis of National's tape made by United States Gypsum states: "The perforations appear to be arranged roughly in six rows, although the pattern seemed almost random and was not too uniform."

The Court recalls looking at the National tape and finding that it was arranged in rows as though it were fanned in a pattern.

Claims of the Gill patent restrict the perforations to .005 inches. The average diameter of the perforations of National's tape is reported to be .0073—one and one-half times larger than the claims of the patent in suit suggests. Any arrangement of perforations of any size which in arrangement and size would differ from the strict and literal reading of the claims of Gill would be free and noninfringing.

In view of the foregoing, I am compelled to find that regardless of the suggested utility of spark perforation, if there be utility read from the language of the claims it must be reflected in the breadth and exactness of the claims, and the defendant's tape does not violate either. It is neither as broad or as exact. And in this field of tech-

nology, if there is to be utility, it cannot be offended by structures which differ 100 per cent on the one hand and 150 per cent on the other. This is particularly true here where the Patent Office refused a patent on the broad basis of the original application as to spark perforated tape, and the manner of manufacture, and then limited Gill, et al., to a narrowly defined tape used in a particular combination and method.

I find there to have been no infringement, actual, direct or procured.

This leaves me with the question of validity. Is Gill a patent of a combination or method, which considering the art at the time, was an invention and was patentable? I think it was.

I am convinced that in a patent infringement case the plaintiff has the burden of proving that it owns the patent in suit and that the defendants have infringed it, and that where the defendants in answer allege invalidity, the burden upon mere proof of ownership shifts to the defendant to go forward with the evidence. Section 282 of Title 35, United States Code, provides:

> "A patent shall be presumed valid. The burden of establishing invalidity * * * shall rest on a party asserting it."

Defendant's principal argument on invalidity relates to the Crandell patent 2,064,784, which defendants consider anticipating prior art. This is the balloon cloth tape. I cannot agree.

There is no question about the fact that balloon cloth was just cloth. It lacked tensile strength. It lacked those controls in holes which would provide for universal and commercial use of the extent contemplated by the industry, and it did not contain perforations.

Semantically and otherwise, there is a difference between holes in cloth left by the process of weaving threads to-

gether and holes in paper perforated mechanically under conditions which yield to consistent control.

Defendant argues that wallboard tape having holes that permit air under the tape to escape is old and there is no invention in changing the size of the holes.

But passing air while at the same time retaining cement is a process of which cloth tape is highly incapable when compared to paper tape.

The arguments of defendants on this topic are not convincing, and no evidence was submitted adequate to meet the burden cast upon defendant to justify denying to plaintiff the inventiveness of the patent in suit over the older cloth tapes.

The same situation holds with regard to the earlier metal and punch perforated tapes, and I find defendants have failed to meet their burden on these items of alleged prior art also.

Defendants urge that unperforated tape passes air with relative equivalence to spark perforated tape, and in extended experimentation in court sought to establish under controlled circumstances that to a scientific certainty this fact was true.

I viewed with great interest these experiments and I am convinced that grave doubt remains with me as to whether these tests can reproduce the actual performance of different tapes in practical day-to-day use. At least the issue is left with the trier of fact as problematical.

As was stated in *Medusa Concrete Waterproofing Company* v. *Ceresit Waterproofing Company, et al.*, 271 F. 122, 123:

> "Laboratory tests cannot turn the balance in the scale against practical use."

These factors converge with evidence of increased and eventually almost exclusive use of spark perforated tape throughout the industry to cause this court to find that the patent in suit had invention and utility.

Specificity of invention does not militate against validity. Neither does simplicity of invention. *Harris* v. *National*, 171 F. 2d 85.

One who achieves significant functional improvements in a mechanism or process already in some form of use need not be barred from patent protection merely because the result was attained by a simple innovation or change. *Universal, Incorporated* v. *Kay Manufacturing Corporation*, 301 F. 2d 140, a 1962 decision.

When there is doubt as to the question of invention, the presumption which arises from the issuance of a patent may avail itself to the court that the court resolve this doubt in favor of validity. *Electric Vacuum Cleaner Co., Inc.* v. *P. A. Geier Company*, 118 F. 2d 221, a 1941 decision.

There has loomed before me in this cause sufficiently such a *doubt* as to justify my calling into play this well-established axiom of the patent law.

Defendant urges that others manufactured spark perforated tape before the Gill patent was issued. The evidence does not to the satisfaction of the court establish that the particular type of spark perforated tape which eventually in 1956 became the subject matter of the patent issued Gill, et al., was ever manufactured or used by anyone.

It may be that spark perforated tape was in the process of experimentation and even use by others, and defendants, prior to one year before the issuance of the patent. But the patent in issue relates to not just any spark perforated tape; it relates to a specific tape, as I have heretofore discussed, and there is no proof whatsoever as to the anticipation of the claims as I have interpreted them by anyone prior to the application for the patent.

Defendants insist that there was prior public use by plaintiff which was more than mere experimental use. Not only for the reasons stated above, but for a further and more commanding reason this position must fall.

It is clear that to bar the application on his own public use, the patentee must have completed and thereafter put into public use the invention, the same identical invention, more than a year before the patent filing date.

The courts appear in substantial conformity that there is a great deal of difference between the requirements of a reduction to practice and the requirements attending experimentation that continues in an attempt to further perfect the device beyond the requirements of a reduction to practice.

This is particularly true whereas, in the instant case, and even though there was no patent issued upon the machinery for making the tape, the process by which it would be made was an integral part of the procedure for completion of the invention. *General Motors Corporation* v. *Bendix Aviation Corporation,* 123 F. Supp. 506, 520, 1954. I believe that is Judge Swygert's decision. *Randolph* v. *Allis Chalmers Mfg. Co.,* 264 F. 2d 533, 535.

It seems to me that from all of the circumstances it must appear from a delay in application that there was a tendency toward abandoning the intent to patent while continuing free production and use, to negate compelling evidence that the use to which the invention was put was experimental. *Hobbs* v. *Wisconsin Power and Light Company,* 250 F. 2d 100, Judge Swygert after he arrived upon the Court of Appeals. From all of the evidence I find that there was no prior use by the plaintiff which would bar the patent, and I find, as I have indicated above, that the patent is valid and should stand, but stand within the severely narrowed limits of the literal language of its claims.

As hereinabove stated, I find the inclusion of Southwick as co-inventor was accidental and without the slightest purpose to defraud or to contrive and, since I am prepared to, and do hereby find the patent valid, I am also prepared

to enter my order directing that the patent on proper notice and hearing be corrected to delete the Southwick name.

One matter further poses itself before me. Plaintiff has asked for attorneys fees. Having found that defendants, and both of them, have in no way infringed, what plaintiff actually has in its Gill patent, this request would be denied summarily.

In order, however, that I be understood further on this issue, to the end that I answer before I am asked should the question be raised by either of the other parties, let me say that the Seventh Circuit consistently has held that defendants' claims for attorneys fees or other parties' claims for fees must be denied except where it is absolutely plain that the opposing side did not bring the suit or bring the charge in good faith.

In the absence of a specific finding by the District Court, well supported by the record, that there are "exceptional circumstances" justifying the award, then it should not be granted. *Apex Electrical Mfg. Co.* v. *Altorfer Brothers Company*, 238 F. 2d 867, 874, Seventh Circuit, 1956.

The Seventh Circuit has regularly reversed such awards by the courts below and I regularly never allow those awards.

(*Binks Manufacturing Company* v. *Ransbury Electro-Coating Corporation*, 281 F. 2d 252, 260; *Continental Art Company* v. *Bertolozzi*, 232 F. 2d 131, 134, Seventh Circuit, 1956.)

In accordance with the foregoing, it is my request that within ten days from the date hereof all parties submit to this Court their proposed findings of fact and conclusions of law to be entered in this cause, at which time the matter will be set down for post-judgment—

Mr. Pendleton: Did you say all parties, your Honor?

The Court: Yes. I say "all parties" because I found no infringement but I found the patent valid.

Mr. Pendleton: Yes.

Mr. Smith: Your Honor, I don't think you decision covered the misuse problem, at least I didn't understand it to.

The Court: You are referring to the misuse by the plaintiff?

Mr. Smith: Yes.

The Court: I think I directed myself to the question.

Mr. Pendleton: We so understood, your Honor.

The Court: In three sentences.

* * * * *

IN THE UNITED STATES COURT OF APPEALS.
For the Seventh Circuit.

September Term, 1966 April Session, 1967

Nos. 15126, 15127

UNITED STATES GYPSUM COMPANY, *Plaintiff-Appellee and Appellant,*
vs.
NATIONAL GYPSUM COMPANY, *et al., Defendants-Appellants and Appellees.*

Appeals from the United States District Court of Northern Illinois, Eastern Division.

October 2, 1967

Before KNOCH, SWYGERT and FAIRCHILD, *Circuit Judges.*

FAIRCHILD, *Circuit Judge.* United States Gypsum Company sued National Gypsum Company and Plaza Plastering Co. for infringement[1] of the Gill patent.[2] The district court found the patent valid but not infringed. All parties appealed.

We conclude that the district court misconstrued the patent, that the patent was infringed if valid, and that the cause should go back to the district court to consider and determine certain issues as to validity, after supplementary trial if deemed necessary.

1. Contributory infringement and actively inducing infringement are averred against National.

2. No. 2,749,267, "Method of Covering the Joint Between Wallboard and the Resultant Product," issued June 5, 1956 to Joseph W. Gill (and another whose name was improperly included and has since been removed), and assigned to plaintiff.

The patent contains five claims, the first to a combination and the other four to methods, the parties and the district court having usually treated claim 5 as representative of the method claims. All claims concern the art of producing smooth, seamless joints in walls made of wallboard.

Drywall construction is presently used in over 70 percent of residential construction. Large sheets of wallboard are nailed to studding to form interior walls. Where two sheets join, the industry has for a long time used a cement or "mud" and strips of bridging material such as cloth, metal, or paper. Machines are widely used to apply the tape. Those machines generally apply the cement to the back of the tape before the tape is placed along the joint. Later a top coat cement is applied to make the joint smooth and indistinguishable from the rest of the wall.

The several types of tape met with varying difficulties. Loosely woven cloth tape did not have sufficient transverse strength. Smooth metal tape did not form a solid bond with adhesives. Metal tape with holes allowed the cemet to exude through the holes and harden into "keys" which helped to hold the tape tight, but *required sand*ing. Paper tape with punched holes often caused the pattern of holes to show through the finishing coat, and when used in the taping machines caused difficulty because the adhesive came through the holes before the tape was on the wall. Perforation by punching often left burrs, and nodules of cement were likely to form on the surface of the tape away from the wall. Paper tape without perforation was also used some years ago, but apparently blisters will form unless there is some way for the air to escape.

The Gill patent is directed at a particular kind of tape, with minute perforations, to be used on wallboard joints, although four claims pertain only to a method of using it, and in claim 1, the tape itself is patented only as one

element of a combination. The patent office had refused to patent the tape alone and the machine devised for producing it.

Claims 1 and 5 of the Gill patent are:

> "1. The combination with wallboards attached to a support and having edges in substantially abutting relationship forming a wallboard joint, of a strong thin cellulosic strip having perforations throughout with diameters from about 0.02 inch to 0.002 inch, said strip being adhesively secured over said joint and the edges of said wallboards adjacent thereto.
>
> "5. The method of covering the joint between adjacent wallboards which comprise adhesively securing over said joint a strip of strong paper provided with substantially uniformly arranged spark-produced perforations having diameters from about 0.02 inch to 0.002 inch to permit the escape of air entrapped beneath said strip while substantially preventing the escape therethrough of adhesive employed to secure the strip in place."

Infringement.

The district judge first addressed himself to the question of infringement. It is clear that National has produced and sold spark perforated paper tape for use on wallboard joints and that Plaza has so used it, all without license under the Gill patent. It also appears that National's management knew of the patent and considered that there would be infringement if the patent were valid. The court, however, considered the National tape sufficiently different from the tape described in Gill so that its use did not infringe. The conclusion was based on an interpretation of Gill in three particulars which, with all respect, we consider erroneous.

Claims 1, 2, and 5 state that the perforations in the tape have "diameters from about 0.02 inch to 0.002 inch . . .". Claim 3 says "diameters from substantially 0.02 inch to

substantially 0.002 inch", and Claim 4 says "diameters of substantially 0.005 inch".

Elsewhere, in the specifications, Gill explained: "The perforations, resulting from the high potential spark passing between pairs of electrodes are minute, averaging about .005 inch in diameter, generally within the range of from .002 inch to .02 inch in diameter. Many of the openings are somewhat elongated or oval, and the diameters specified are the average diameters arrived at by averaging the minimum and maximum dimensions of the openings."

The perforations in a sample of National tape ranged in average diameter from a maximum of .0168 inch to a minimum of .0024 inch, all within the range indicated by Gill. The overall average was .0073 inch, larger than the .005 inch average indicated by Gill. This difference in the overall average was considered significant by the district judge. We disagree.

Claims 1, 3 and 4 refer to "perforations throughout". Perforations in the sample of National tape, which was 2-1/16 inches wide, did not occur, generally, within the outer half-inch (approximately) on either side. The district judge construed "throughout" in the claims as requiring the perforation to appear throughout the complete width of the tape. Claims 2 and 5 refer to "substantially uniformly arranged" perforations. The district judge noted a description of the National tape: "The perforations appear to be arranged roughly in six rows, although the pattern seemed almost random and was not too uniform," and recalled his own observation "that it was arranged in rows as though it were fanned in a pattern."

Statements by Gill in the specifications make it clear that the expression "throughout" did not mean that the perforations must be distributed close to and up to each edge of the tape. Using tape with the common width of 2-3/16 inches, the suggested distribution would leave a margin,

without holes, of 15/32 inch along each edge. This is very close to the half inch margin in the National tape.

It is also said:

> "The hole spacing and pattern in the tape are erratic. This results from the fact that the path of the sparks between pairs of electrodes varies considerably, due primarily to the lack of uniformity of the electrical resistance or conductivity on the tape itself."

The material just quoted shows that the phrase "substantially uniformly arranged" did not contemplate the symmetry and exactness of pattern which the district judge seems to have found essential.

Against the prior art background of punch perforated holes, the gist of the invention (if all tests of invention be met), was the use of tape with much smaller spark produced holes. The difference in average size of the perforations and in the exact pattern of distribution do not seem to us to warrant the significance accorded by the district judge.

We conclude that if the patent was valid, it was infringed.

Defendant raised several issues which require further consideration.

Obviousness.

The district judge recorded his opinion, and elected to have it serve as findings of fact and conclusions of law.

He correctly concluded that the prior art did not anticipate the Gill patent. He did not, however, address himself to the issue of obviousness under 35 U. S. C. sec. 103, although in fairness it should certainly be observed that his decision was given before the decision of the Supreme Court of the United States in *Graham* v. *John Deere Co.*[3]

3. (1966), 383 U. S. 1, 86 S. Ct. 684, 15 L. Ed. 545.

The analytical steps which a court must take in order to determine the issue of validity under sec. 103 have now been clearly set forth in *Graham:*

> "... Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined ..."[4]

For the reasons indicated in *Cloud* v. *Standard Packaging Corporation*[5] we think it the sounder procedure for the determination of this issue to be made initially in the district court.

The issue whether the invention is obvious must, of course, be determined with respect to the invention as construed by this opinion.

Public use.

Defendants averred that the invention was in public use more than one year before March 30, 1950, and produced evidence which they contended would support that claim. Plaintiff contends that any use of its own was experimental and not public. The district judge so decided, and we think the finding was not clearly erroneous. The district judge also decided there had been no prior public use by others, but very clearly limited his decision to the invention as he had restrictively interpreted it in his decision of the infringement issue. Thus the issue with respect to prior public use by others will be open for decision upon remand.

Misuse.

Defendants averred that plaintiff has misused the patent and in bringing suit was attempting to obtain a monopoly

4. Id. at page 17.

5. (7th Cir., 1967), 376 F. 2d 384, 391.

in the sale of unpatented tape with perforations of .002 inch to .02 inch in diameter.

Defendants appear to contend that a finding of misuse must follow from the fact that when plaintiff sells its own unpatented spark perforated tape it grants a license to use it under the Gill patent.

But it appears that plaintiff does license others who desire to use tape not produced by plaintiff. As we understand the relevant doctrine of misuse,[6] there could be no misuse if the terms on which a license is available to those wishing to use tape manufactured by others are reasonably comparable to the terms for one who uses the patentee's tape. Success on defendant's claim of misuse would require at least a finding that plaintiff restricts licensing for the purpose of compelling the use of its own tape.

Alleged anti-trust violation.

Plaintiff is subject to a decree entered in 1951 in an action by the United States to enforce the anti-trust laws. The decree required plaintiff to grant licenses on certain patents, and restricted the royalties. Plaintiff has granted licenses under Gill and the royalties are measured by the amount of tape used. Defendants claim this is a violation of the decree, and necessarily, therefore, a violation of the anti-trust laws, so that defendant can recover treble damages, the provable damages being attorneys' fees in this action.

To put their theory together, a violation of the decree must be, per se, a violation of an anti-trust law, the Gill patent must be one "relating" to the "use" of "gypsum board" and the tape must be a "patent-free" product.

The district judge, having noted and passed by the question whether the Gill patent, relating to the use of wallboard

6. See *Mercoid* v. *Mid-Continent Investment Co.* (1944), 320 U. S. 661, relied on by defendants.

generally, can be said to be a patent relating to the use of gypsum board, concluded that since tape is used as a component of a patented process, it is not patent-free as the term was used in the decree even though unpatented. A seemingly consistent contemporaneous construction of the term by the court which issued the decree was noted. We agree with the conclusion of the district judge. Moreover, the decree did not merely forbid acts which are violations of the anti-trust laws and it does not follow that a violation of the decree is necessarily a violation of an anti-trust law so that treble damages would ensue.

The judgment appealed from will be reversed and the cause remanded for further proceedings consistent with this opinion.